



(19)

Generated Document.

(11) Publication number: **62076612 A****PATENT ABSTRACTS OF JAPAN**(21) Application number: **60215173**(51) Int. Cl.: **H01L 21/205 H01L 21/263**(22) Application date: **30.09.85**

(30) Priority:

(43) Date of application  
publication: **08.04.87**(84) Designated contracting  
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**(54) MANUFACTURE OF  
SEMICONDUCTOR THIN  
FILM**

(57) Abstract:

**PURPOSE:** To form a semiconductor thin film with superior orientation on a single crystalline or amorphous single crystalline substrate by photo-decomposing a mixture gas consisting of fluorosilane, silane or, desirably, hydrogen.

**CONSTITUTION:** A single crystalline or amorphous single

crystalline substrate whose surface is cleaned with washing or etching is placed in a thin film forming device 7 which has at least a light permeating window 1, a substrate holding means 3, a substrate heating means 4, a gas introduction means 5 and a vacuum discharge means 6, and the substrate is heated to 100W400°C under vacuum discharge. The material gas is supplied to the said device, with the flowing ratio of silane to fluorosilane being 0.5W50 and the flowing ratio of hydrogen to the fluorosilane being more than twice the former. As the fluorosilane,  $\text{SiH}_4$ - $n\text{F}_n$  (integer of  $n=1$ W3) or  $\text{Si}_2\text{F}_6$  is usable. As the silane, monosilane, disilane, trisilane expressed with  $\text{Si}m\text{H}_{2m+2}$  (integer of  $m=1$ W3) are usable. As the III group compounds to be added to the mixture gas, dibolane ( $\text{B}_2\text{H}_6$ ) is usable. As V group compounds, phosphine ( $\text{PH}_3$ ) or arsine ( $\text{AsH}_3$ ) is usable.

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